

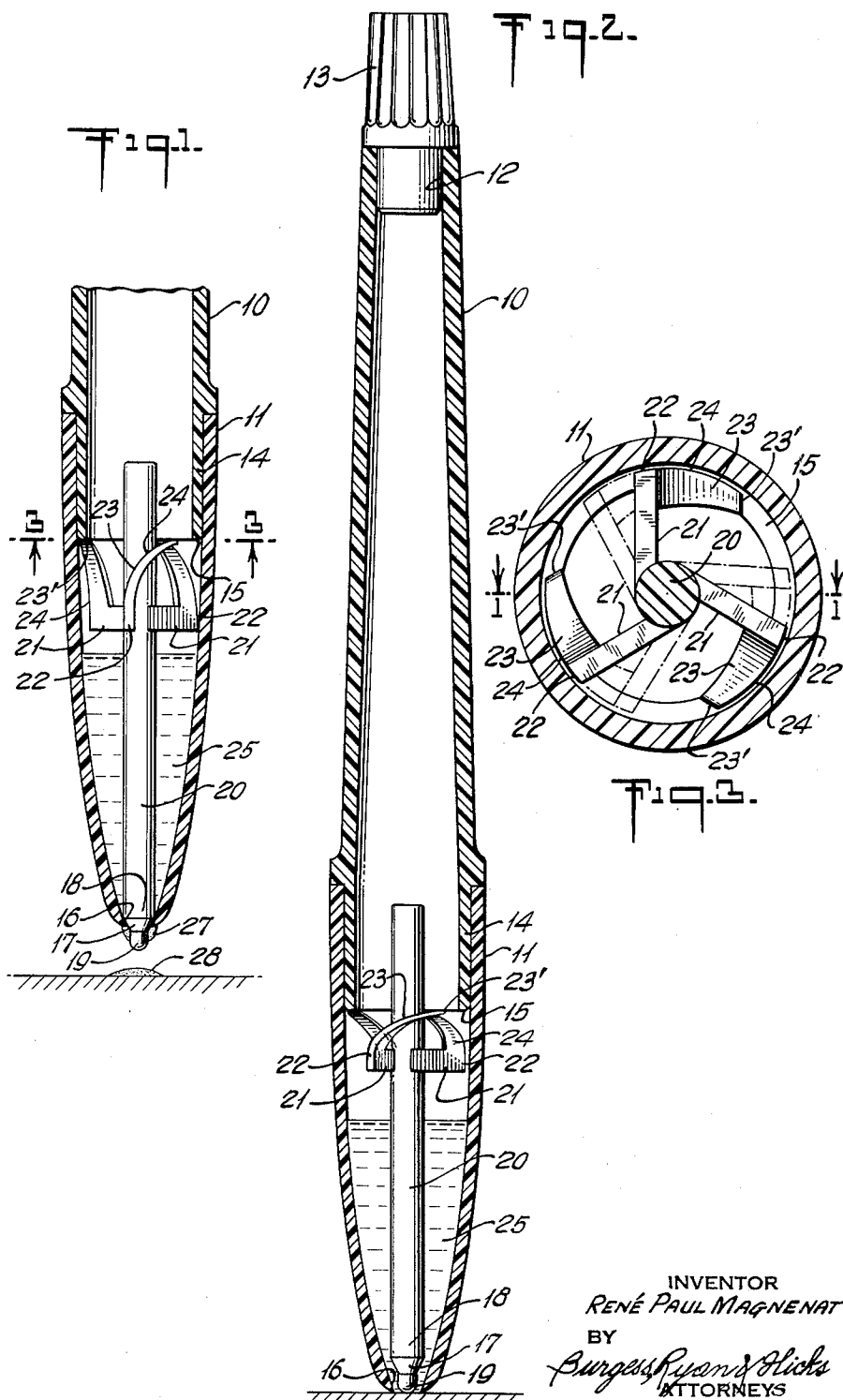
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PASTE DISPENSER

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PASTE DISPENSER

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8 Claims. (Cl. 222-501)

This invention relates to a hand-held paste dispenser and more particularly a valve structure for use in such a dispenser.

An object of the invention is the production of a paste dispenser having a paste reservoir similar in general shape to a fountain pen and with a valve structure at its lower end adapted to deposit a drop of liquid paste on any surface against which the end is pressed.

A further object is the provision of a nylon valve structure which may be injection molded in one piece and which combines means for sealing a paste dispensing orifice with spring means for urging the valve into a sealing position.

Another object is the provision of means for rotating the valve in the dispenser during the use thereof in order to facilitate paste flow and to break the film of hardened paste which may form in the orifice.

A further object is the provision of a valve structure which will not remain permanently open even if depressed beyond its normal range.

Further objects and advantages will be apparent from the following description and drawings, in which

Fig. 1 is a side view of the paste dispenser taken on plane 1-1 of Fig. 3;

Fig. 2 is a partial side view similar to Fig. 1 showing the dispenser in the process of applying paste to a surface; and

Fig. 3 is an enlarged sectional view of the dispenser taken on plane 3-3 of Fig. 1.

In Fig. 1 a dispenser is shown comprised of reservoir body 10 and a nose 11, both of which may be injection molded of plastic. The upper end of the reservoir body has a filler opening 12 closed by filler plug 13 which makes a friction fit therein. The filler plug is injection molded of a resilient plastic, such as nylon, and may be removed and replaced by hand for filling purposes.

The reservoir body is provided with a cylindrical lower portion 14 which fits within the nose. The joint between these parts may be made permanent when the dispenser is assembled by suitable glue. The reservoir body bears annular shoulder 15.

The lower end of the nose is pierced by a paste dispensing orifice defined by valve seat 16. When the dispenser is not in use the orifice is closed by sealing surface 17 on valve head 18 which abuts the valve seat. Attached to the valve head is valve stem 19 which projects through the paste dispensing orifice externally of the nose. Extending upward from the valve head is cylindrical valve rod 20. Three spring elements are attached to the valve rod near its middle. These are shown in relaxed form in Fig. 1 and by the solid lines in Fig. 3. Each is comprised of an arm 21 extending laterally of the valve rod in a plane tangent to the surface of the valve rod. The inner surface of the nose is cylindrical at the location of the spring elements and each arm has an outer end 22 loosely abutting this cylindrical surface. Attached cantilever fashion adjacent each outer end 22 is a leaf spring 23 of arcuate form. The leaf spring at

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its point of attachment lies in an imaginary plane containing the arm 21 and tangent to the cylindrical surface of the valve rod 20. It curves away from this plane on the side on which the valve rod lies and has a contact portion 23' abutting annular shoulder 15.

As may best be seen in Fig. 3 the leaf springs lie in a section of the nose which is substantially cylindrical on its inner surface. The outer edge 24 of each leaf spring is curved to conform to this cylindrical surface.

It has been found that the complete valve structure may be injection molded of nylon as this plastic shows sufficient strength and wear resistance of the valve stem combined with resiliency in the spring elements.

In use the reservoir is filled through the filler opening with liquid paste 25 and the opening closed with the filler plug. The dispenser may then be carried in the pocket without fear of leakage. When it is desired to apply the paste to a surface 26, the nose portion is pushed down on the surface as shown in Fig. 2. This depresses the valve stem and opens the valve, allowing a drop of paste to contact the paper, to which it adheres when the dispenser is raised. Fig. 1 shows the dispenser after depositing a drop of paste 28. As may be seen, an excess 27 of paste remains about the outside of the nose portion on the valve stem and a thin film remains between the valve seat and the sealing surface. Unless the dispenser is used immediately this excess may thicken upon exposure to the air, resulting in a rubbery obstruction or a hard plug. One of the advantages of applicant's valve structure is that upon depression of the valve stem the valve head not only travels inwardly of the reservoir but rotates about its axis. This effect occurs because the contact portions 23' of the leaf springs do not slide relative to the annular shoulder 15 and depression of the valve stem consequently causes the point of attachment of the leaf spring to the arm to move up and to one side. The effect is seen in Figs. 1 and 2. In Fig. 3 the position of the arms when the valve stem is depressed is shown by dashed lines.

The rotary movement of the valve head during depression aids the linear movement thereof in stretching and breaking any rubbery film which may have formed, thereby insuring good paste flow.

The spring elements serve not only to keep the valve head in contact with the valve seat, but to locate the valve structure coincident with the central axis of the reservoir by their contact with the walls of the nose.

The disclosed valve structure has an additional advantage in that it is not possible to force it inwardly of the reservoir so far that it remains in a depressed state. Paste dispensers are used in large quantity in schools where children are apt to poke the end of the valve stem inwardly, out of curiosity or to increase the paste flow when the reservoir is running dry. Various valve structures hitherto developed, while satisfactory in other respects, may remain in a depressed state when so poked, destroying the utility of the valve.

The following is claimed:

1. In a fluid dispenser having a hollow fluid reservoir, a valve seat defining an orifice in the reservoir, a valve in the reservoir movable with respect thereto from a closed to an open position, a valve head on the valve, a sealing surface on the valve head cooperating with the valve seat when the valve is in the closed position to block the orifice and when the valve is in the open position to permit fluid flow through the orifice, a valve stem on the valve projecting through the orifice and adapted to move the valve from the closed to the open position in response to pressure on the outer end thereof, a valve rod projecting into the reservoir from the valve head in the direction of movement of the valve from the closed to the open position, a shoulder inside

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the reservoir and rigid with respect thereto, the improvement comprising a spring element, said spring element comprised of an arm extending laterally of the valve rod, inner and outer ends on the arm with the inner end attached to the valve rod, a leaf spring extending from the outer end of the arm at an angle with respect to the direction of movement of the valve, contact portions on the leaf spring remote from its connection with the arm and in contact with the shoulder, the resiliency of the leaf spring against the shoulder tending to move the valve into the closed position.

2. The improvement of claim 1, comprising at least two spring elements as described therein in which the spring elements guide the movements of the valve by contacting portions of the reservoir.

3. The improvement of claim 1, comprising at least three spring elements as described therein in which the spring elements guide the movements of the valve by contacting portions of the reservoir.

4. The improvement of claim 2 comprising a reservoir section having a cylindrical inner surface located adjacent the spring elements and curved surfaces on the spring element conforming to the cylindrical surface.

5. The improvement of claim 2 wherein the reservoir is formed of a nose portion with the orifice therein and a body portion having an end fitting within an open end of the nose portion, said end of the body portion bearing the shoulder in the form of an annular surface disposed in a plane perpendicular to the direction of movement of the valve.

6. In a valve structure adapted to move along a line

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of action between a closed and an open position, a valve head for blocking an orifice, a valve rod having an axis parallel to the line of action, and at least three spring elements equally spaced about and attached to the valve rod at a position remote from the valve head, each said element comprising an arm lying in a plane perpendicular to the axis and joining the valve rod in a direction substantially tangential to the surface thereof, an outer end of the arm, a leaf spring attached to the outer end of the arm, the leaf spring being arcuate in form with the end of the spring attached to the arm being tangent to an imaginary plane, said imaginary plane being tangent to the cylindrical surface of the valve rod and containing the arm, the leaf spring bending up from the imaginary plane, and an outer edge on the leaf spring conforming to the surface of an imaginary cylinder having the axis of the valve rod as a central axis.

7. The valve structure of claim 6 which is formed in a single piece of injection molded nylon.

8. The valve structure of claim 6 in which the leaf spring bends up from the imaginary plane on the same side thereof as that on which the axis of the valve rod is located.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,984,393

May 16, 1961

René P. Magnenat

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 2, line 45, for "head", second occurrence, read
-- seat --.

Signed and sealed this 17th day of October 1961.

(SEAL)

Attest:

ERNEST W. SWIDER

Attesting Officer

DAVID L. LADD

Commissioner of Patents

USCOMM-DC